

# CLEAN JOBS AMERICA

## NEARLY 3.3 MILLION CLEAN ENERGY JOBS<sup>1</sup>

**In every region and every state in America, clean energy is creating jobs and careers.** Nationwide, nearly 50,000 new clean energy jobs were created in 2018, bringing the total number of Americans who work in clean energy to 3.26 million.

While jobs in solar declined in part because of tariffs on steel and solar panels, wind energy jobs grew by nearly 4 percent and now competes with fossil fuels in many markets.<sup>2</sup>

Energy efficiency continues to lead the clean energy sector in total number of jobs, growing 3.4 percent to 2.3 million jobs.

But the big story in 2018 was around clean vehicles and storage.

Driven by growing consumer demand, the number of jobs in clean vehicles manufacturing increased by 16 percent. About 254,000 Americans now work at companies building hybrid, electric and other clean vehicles, while another 486,000 Americans work in companies that manufacture parts that make vehicles more efficient.

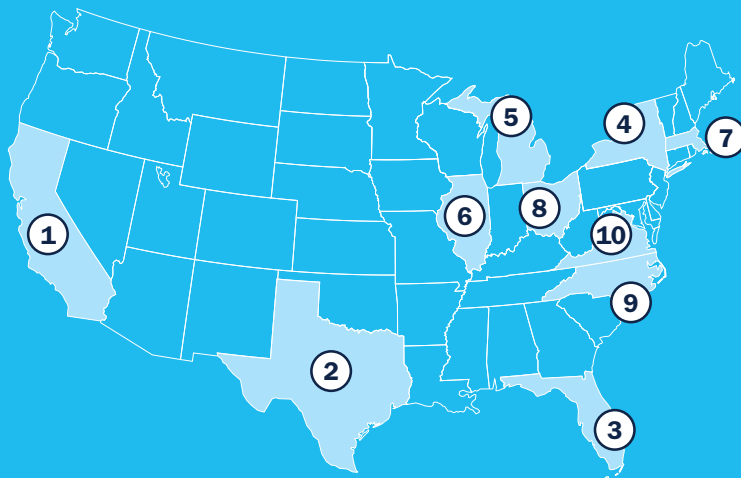
Energy storage saw a 14 percent increase in jobs as utilities, businesses and consumers deployed

more batteries in EVs and with solar and wind installations, while grid modernization jobs grew by 3.3 percent.

Smart state policies continue to drive much of the growth in clean energy and the jobs and investments that come with it. But with a new Congress comes new opportunities to pass meaningful legislation on a federal level to keep these jobs growing nationwide. See sidebar for more.

### TOP 10 STATES FOR CLEAN ENERGY JOBS

| RANK | STATE          | TOTAL*  | SOLAR   | WIND   | ENERGY EFFICIENCY | CLEAN VEHICLES |
|------|----------------|---------|---------|--------|-------------------|----------------|
| 1    | California     | 512,934 | 126,507 | 5,785  | 318,542           | 22,389         |
| 2    | Texas          | 233,447 | 11,433  | 25,386 | 162,816           | 17,800         |
| 3    | Florida        | 158,652 | 10,528  | 4,461  | 118,412           | 9,360          |
| 4    | New York       | 156,059 | 11,603  | 3,491  | 123,292           | 8,624          |
| 5    | Michigan       | 126,081 | 5,419   | 4,783  | 85,061            | 25,304         |
| 6    | Illinois       | 123,247 | 5,341   | 8,706  | 89,469            | 10,417         |
| 7    | Massachusetts  | 116,491 | 16,527  | 1,983  | 86,473            | 3,184          |
| 8    | Ohio           | 112,486 | 8,108   | 1,080  | 81,676            | 16,646         |
| 9    | North Carolina | 110,913 | 8,912   | 908    | 86,559            | 7,280          |
| 10   | Virginia       | 95,158  | 4,241   | 1,628  | 78,670            | 5,436          |



\* Total includes renewable energy, energy efficiency, clean vehicles, battery storage, advanced biofuels, low-impact hydro and other sectors.

### CLEAN ENERGY GROWTH IN PERSPECTIVE

## 110,000

Clean energy jobs grew 3.6 percent in 2018, adding jobs in nearly every state and combining to add over 110,000 net new clean energy jobs nationally.

## 12

Number of states that have or are considering policies that get 100 percent of their electricity from clean energy sources.

## 3X

Clean energy jobs outnumbered fossil fuel jobs nearly 3 to 1 in 2018.

## 10

The number of states that generate more than 20 percent of their electricity from wind and solar—Kansas, Iowa, Oklahoma, North Dakota, South Dakota, Vermont, California, Maine, Colorado, and Minnesota.<sup>3</sup>

## 156 GW

Combined capacity of installed solar and wind surpassed 150GW in 2018. Wind energy is the largest source of renewable generating capacity. A new solar project is installed in America every two minutes.<sup>4,5</sup>



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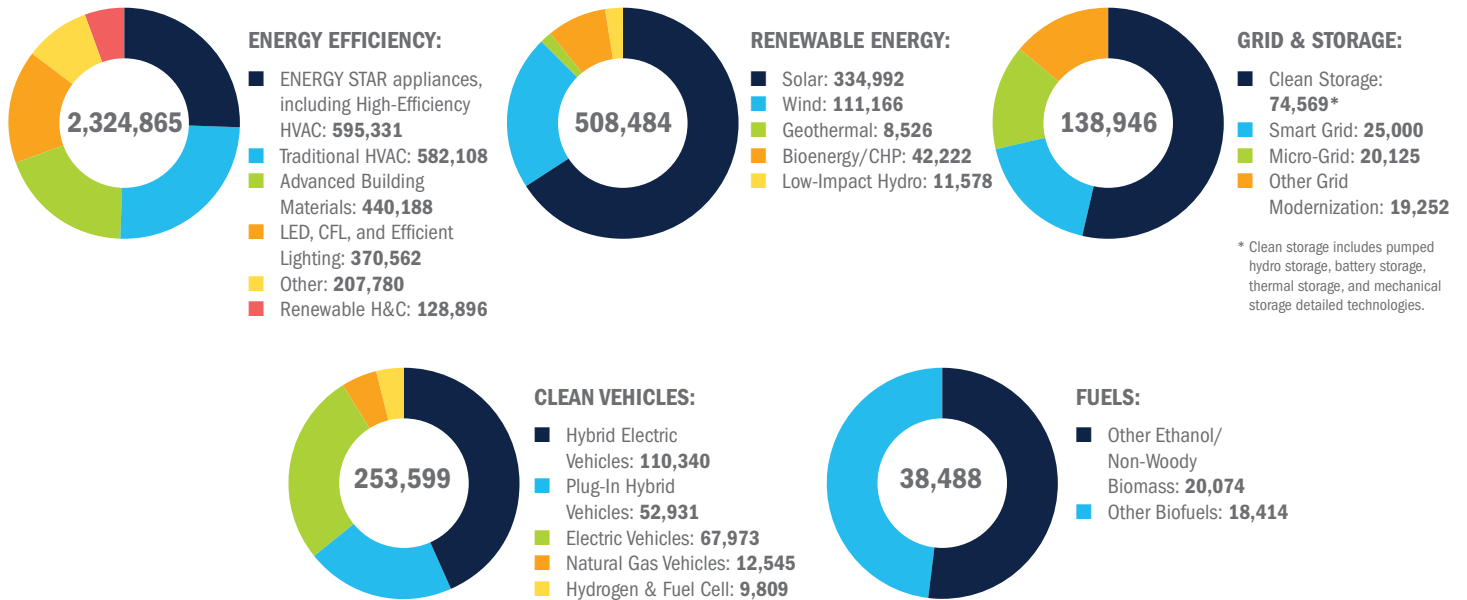
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## WANTED: FEDERAL ACTION ON CLEAN ENERGY

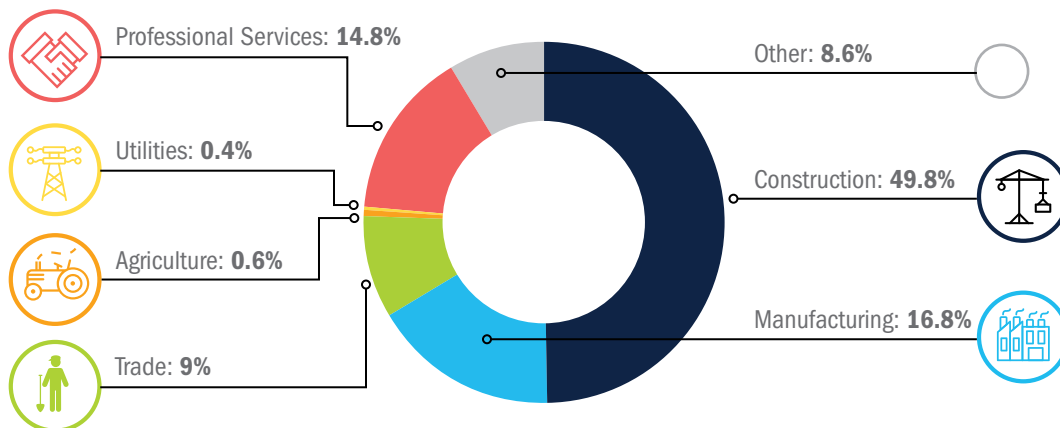
To continue creating tens of thousands of new jobs for Americans across the country, Congress should:

- // Make sure any infrastructure bill includes policies to modernize the grid and expand electric vehicle charging infrastructure to keep grid and storage jobs growing.
- // Stop rollbacks to fuel economy (CAFE) standards that are saving business and consumers money with every visit to the pump and also are driving jobs and American innovation in the clean vehicles sector.
- // Upgrade and extend expired energy efficiency tax credits for commercial and residential buildings; clarify the Investment Tax Credit (ITC) to apply to energy storage and offshore wind and lift the cap on the electric vehicle tax credit to create more jobs in these sectors.
- // Properly fund R&D investments in clean energy innovation and efficiency at the U.S DOE's Office of Energy Efficiency and Renewable Energy, the Loan Programs Office, and programs such as ARPA-E, and the Advanced Technology Vehicles Manufacturing (ATVM) program.

### INDUSTRY BREAKDOWN: JOBS



### CLEAN JOBS BREAKDOWN BY VALUE CHAIN



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## CLEAN VEHICLES 255,000 JOBS

- // Clean vehicles now account for about **13 percent** of all the jobs in the motor vehicles industry
- // **15.4 percent** nationwide job growth in 2018
- // **42 states** saw double-digit job growth in 2018, with 15 seeing above 20 percent growth
- // **486,000** additional employees in the motor vehicle industry work with parts making vehicles more fuel efficient

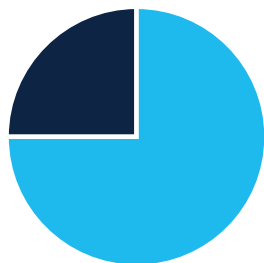


## GRID & CLEAN STORAGE 139,000 JOBS

- // **9 percent** job growth in 2018, with employers projecting growth of 4.4 percent in 2019.
- // **Grid modernization** industries added over 2,000 jobs, a 3.3 percent growth rate.
- // California and Texas lead the U.S. in Grid & Clean Storage jobs again, but Nevada saw biggest rise in rankings—jumping from 25th to 4th thanks to a **380 percent job surge** in 2018.



## SOLAR + WIND 446,000 JOBS



### 335k SOLAR JOBS

- // Solar provides the largest share of electric power generation in the U.S., **100,000** more than the next two sectors combined.
- // Solar jobs fell 4.2 percent in 2018—after nearly a decade of growth—but employers are projecting job growth of **over 8 percent** in 2019.
- // 89 percent of solar job losses were in maturing in states of MA and CA. In 18, solar jobs increased.
- // **66 percent** of solar jobs (224k) are involved in manufacturing and construction.

### 111k WIND JOBS

- // Wind provides the **3rd largest** share of electric power generation jobs, about 1,500 fewer employees than natural gas.
- // Jobs grew **3.5 percent** last year, with employers projecting job growth of nearly 5 percent for 2018
- // All but **five states** (and D.C.) saw job growth in wind energy in 2018
- // **56 percent** of wind jobs (63k) are involved in manufacturing and construction.



## ENERGY EFFICIENCY 2.3 MILLION JOBS

**76,000**

The number of new jobs added by energy efficiency companies in 2018—accounting for over half of all new energy jobs

**7.4%**

Expected job growth in 2019 by employers, the highest across the entire energy sector

**1.4 M**

The number of energy-efficiency jobs in construction

**321,000**

The number of manufacturing jobs in energy efficiency, an increase of 2 percent

**1 in 3**

More than one out of every three employees working in the energy sector (from traditional energy to motor vehicles) is involved in energy efficiency

**1 in 4**

In 2018, ENERGY STAR appliances employed more than 1 out of every 4 energy efficiency workers, largest category of employment

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### 3.26 MILLION CLEAN ENERGY JOBS: HOW DO THEY STACK UP?

**3.04 M**

That's the number of teachers in elementary, middle & secondary schools<sup>6</sup>

**2.25 M**

That's how many waiters & waitresses work in America's bars and restaurants<sup>7</sup>

**211,000**

The number of jobs in coal mines, gas fields and oil patches combined<sup>8</sup>

**1.15 M**

The number of jobs in the entire U.S. fossil fuel industry

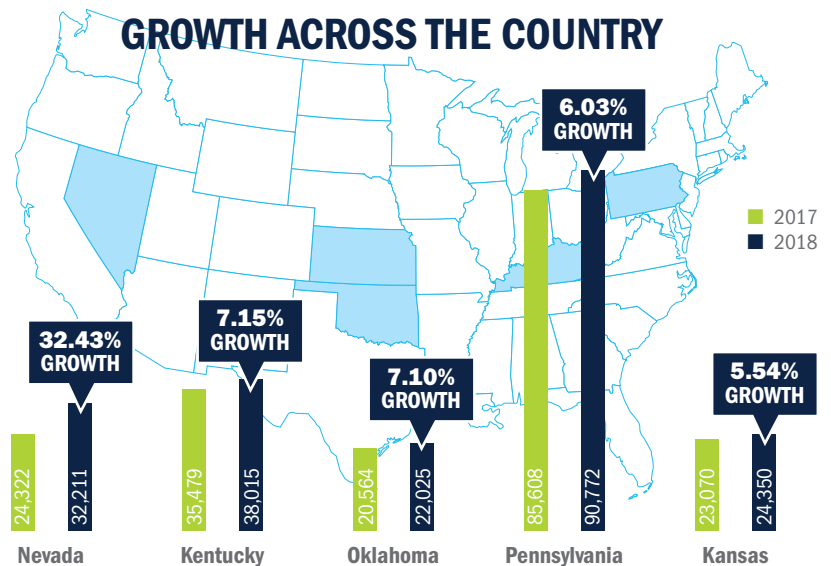
### AMERICANS OVERWHELMINGLY WANT MORE CLEAN ENERGY

- // More than **85 percent** of Americans—over two-thirds of Republicans (71%)—support requiring utilities in their state to produce 100 percent of electricity from clean energy sources by 2050.<sup>9</sup>
- // Between 2013 and 2018, support for renewable energy research increased from 73 percent to **88 percent** among registered voters, including a 30 percent shift among conservative Republicans.
- // A majority of Americans (58%) say they think policies to transition from fossil fuels to clean energy will improve economic growth and create new jobs.

### WHY SUCH STRONG SUPPORT? CLEAN ENERGY = JOBS

- // Wind technicians and solar installers are predicted to be the top two fastest-growing jobs over the next seven years.<sup>10</sup>
- // The fastest-growing jobs in 12 states were in renewable energy in 2018.<sup>11</sup>
- // 66 percent of new power capacity in 2019 is projected to come from solar, wind, other renewables, and battery storage.<sup>12</sup>

### GROWTH ACROSS THE COUNTRY



### CLOSER LOOK: CLEAN STORAGE<sup>13</sup>

Clean storage added almost 9,500 new jobs for a 14 percent growth rate in 2018.



#### Solar + storage broke records last year, in 2019...

// The record is projected to be broken yet again because of falling solar and battery prices and continuation of the federal ITC for solar.<sup>14</sup>



#### The U.S. is projected to regain its spot as the world's largest storage market...

// thanks to residential solar-storage, state incentives, and increased utility-scale storage due to increased market certainty.

#### Led by increase EV adoption and home installations, lithium-ion battery installations are projected to ...

// increase by 800 percent from 2018-2022.<sup>15</sup>



#### HIGHWAYS

// More than 1 million EVs are on the road in America, with nearly 50,000 sold nationwide in December 2018 alone.<sup>16</sup>



#### HOMES

// 10x: Residential energy storage deployments led the way in 2018, growing tenfold from 2017 to 2018.<sup>17</sup>



#### MANUFACTURING JOBS

// Tesla's Gigafactory in Storey County near Reno, Nevada brought more than 7,000 jobs to the state in 2018 alone. That made Storey the top county in the nation for clean jobs per capita with more than 1,950 jobs per 1,000 residents, attracting workers and new residents from outside the county just to fill all the new jobs.<sup>18</sup>



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## MORE CLEAN ENERGY = MORE CONSTRUCTION JOBS



More than 1 out of 6 of all U.S. construction jobs are in energy efficiency (17%)<sup>19</sup>

**38.6%**

Wind and solar account for nearly 2 out of every 5 construction jobs in the electric generation sector



Nearly 6 out of 10 of energy efficiency's 2.3 million employees work in construction (1.29 million)

**2019 GROWTH**

Expected construction of renewable energy projects accounts for the majority of the electric power generation sector's projected 7.1 percent job growth for 2019

## CLEAN ENERGY INVESTING A TRILLION DOLLAR MARKET WAITING TO BE UNLEASHED

With the right support and policies, U.S. investors could turn clean energy into an economic powerhouse and unlock a market with near unlimited potential.

### A TURNING POINT OPPORTUNITY:

#### FASTEST-GROWING

Renewable energy resources are now expected to be the fastest-growing source of U.S. electricity generation for at least the next two years, with growth forecasts of 10 percent in 2019 and 17 percent in 2020.<sup>20</sup>

**18%**

Roughly 18 percent of U.S. energy generation is now supplied by renewable sources, up from 11 percent in 2009.<sup>21</sup>

**2035**

By the year 2035, renewable energy is expected to become the world's dominant power source. And by 2050, renewables are expected to supply 75 percent of the world's energy.<sup>22</sup>

### A GROWING MARKET:

#### \$1 TRILLION

Financial institutions in the U.S. (including banks, asset managers, and private-equity firms) are expected to double planned investments in renewable energy, with the potential to mobilize \$1 trillion in cumulative private capital by 2030.<sup>23</sup>

**13.4 GW**

Corporate contracts for clean energy technology more than doubled in 2018 to 13.4 GW (up from 6.1GW in 2017), totaling now more than 32 GW since 2008—the generation capacity of the Netherlands.<sup>24</sup>

**60%**

The U.S. is beginning to dominate a new global market, accounting for 60 percent of global corporate clean energy purchases in 2018.

### GOOD JOBS FOR VETERANS:

Clean energy employs a greater percentage of veterans than most industries—including oil and gas. Percentage of veterans in the workforce of:

**10%**

WIND

**9%**

SOLAR PV

**10%**

ENERGY EFFICIENCY

**8%**

CONCENTRATED SOLAR POWER

**6%**

NATIONAL AVERAGE

**6 to 9%**

FOSSIL FUEL AND NUCLEAR

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## ENDNOTES

- 1 Unless otherwise stated, all data is from the 2019 U.S. Energy and Employment Report, March 2019, NASEO and EFI. See Pages 15-17 for methodology questions. For more questions regarding methodology, visit [www.e2.org/cleanjobsamerica/FAQ](http://www.e2.org/cleanjobsamerica/FAQ).
- 2 <https://www.energy.gov/eere/wind/downloads/2016-wind-technologies-market-report>
- 3 <https://www.eia.gov/todayinenergy/detail.php?id=37233>
- 4 <https://www.awea.org/wind-101/basics-of-wind-energy/wind-facts-at-a-glance>
- 5 <https://www.seia.org/solar-industry-research-data>
- 6 <https://www.bls.gov/iag/tgs/iag61.htm>
- 7 <https://www.bls.gov/iag/tgs/iag722.htm>
- 8 By sector, fossil fuel jobs from electric power production are: coal (86,200), natural gas (43,500), advanced natural gas (69,100) and oil and petroleum (12,500).
- 9 <http://climatecommunication.yale.edu/publications/energy-in-the-american-mind-december-2018/2/>
- 10 <https://www.bls.gov/emp/tables/fastest-growing-occupations.htm>
- 11 <http://www.projectionscentral.com/Projections/ShortTerm>
- 12 <https://www.eia.gov/todayinenergy/detail.php?id=37952>
- 13 Clean Jobs America, 2017 USEER, 2018 USEER, 2019 USEER
- 14 <https://www.greentechmedia.com/articles/read/five-predictions-for-the-global-energy-storage-market-in-2019#gs.FUHXVNmT>
- 15 <https://www.woodmac.com/reports/power-markets-the-future-of-lithium-ion-batteries-demand-technologies-and-investments-29646>
- 16 [http://www.edisonfoundation.net/iei/publications/Documents/IEI\\_EEI%20EV%20Forecast%20Report\\_Nov2018.pdf](http://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20EV%20Forecast%20Report_Nov2018.pdf)
- 17 <https://www.woodmac.com/research/products/power-and-renewables/us-energy-storage-monitor>
- 18 <http://www.diversifynevada.com/wp-content/uploads/2018/12/2018-Tesla-Economic-Impact-Study.pdf>
- 18 Share based on the Bureau of Labor Statistic's preliminary estimate for construction sector employment in December 2018 <https://www.bls.gov/iag/tgs/iag23.htm>
- 19 <https://www.eia.gov/todayinenergy/detail.php?id=38053>
- 20 <http://www.bcse.org/factbook/#>
- 21 <https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2019>
- 22 <https://www.greentechmedia.com/articles/read/global-renewable-energy-investment#gs.UtbXyUa>
- 23 <https://about.bnef.com/blog/corporate-clean-energy-buying-surged-new-record-2018>



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